An Overview of the Impacts of Forest Fires on Soil Properties and Sustainability. (S07-neary154047-Oral)

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Abstract:

The overall effects of fire on ecosystems are complex, ranging from the reduction or elimination of aboveground biomass to impacts on belowground physical, chemical and microbial mediated processes. Depending on fire severity, changes in belowground components can be either beneficial or deleterious to the entire ecosystem. Low severity fire can promote a healthy herbaceous flora, increase plant available nutrients, and thin over-crowded forests. These changes foster healthy and sustainable ecosystems. Severe fires often cause changes in plant succession rates, alter above- and belowground species composition, generate volatilization of nutrients, produce ash entrainment in smoke columns, increase and decrease mineralization rates, alter C:N ratios, and lead to subsequent nutrient losses through accelerated erosion and leaching. In addition, changes in soil hydrologic functioning, degradation of soil physical properties, decreases in soil fauna, and alterations in microbial populations and associated processes can occur. This paper is a general review of the effects of fire on belowground systems and the resulting consequences these changes have for ecosystem sustainability.

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